

ATTACHMENT 1

CURRICULUM VITAE

FREDERICK R. WARREN-BOULTON

Principal, MiCRA
Microeconomic Consulting and Research Associates, Inc.
1155 Connecticut Avenue, N.W.
Suite 900
Washington, D.C. 20036
Tel: 202-467-2504, Fax 202-296-1915
rwb@micradc.com

Education

- 1975 Ph.D., Economics, Princeton University
- 1969 M.A., Economics, Princeton University
- 1969 M.P.A., (Master of Public Affairs) Woodrow Wilson School of Public & International Affairs, Princeton University
- 1967 B.A., Economics, Yale University, *cum laude* with High Honors in Economics

Experience

Principal, MiCRA: Microeconomic Consulting and Research Associates, Inc., Washington, D.C.;
August 1991 - present.

Resident Scholar, American Enterprise Institute for Public Policy Research, Washington, D.C.; May
1989 - April 1990, Adjunct Scholar, May 1990 - present.

Visiting Lecturer of Public and International Affairs, Woodrow Wilson School of Public and
International Affairs, Princeton University, Princeton, NJ; Spring Semester, 1991

Senior Vice President, ICF Consulting Associates, Inc., Washington, D.C.; November 1989 - August
1991.

Research Associate Professor of Psychology, The American University, Washington, D.C.;
September 1983 - 1990.

Deputy Assistant Attorney General for Economic Analysis, Antitrust Division, U.S. Department of
Justice, Washington, D.C.; October 1985 - May 1989.

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Director, Economic Policy Office, Antitrust Division, U.S. Department of Justice, Washington, D.C.;
September 1983 - September 1985.

Research Associate, Center for the Study of American Business, Washington University in St. Louis;
July 1978 - June 1985.

Associate Professor, Department of Economics, Washington University in St. Louis; July 1978 - June
1985. Chairman, Graduate Committee, 1978 - 1980. Chairman, Undergraduate Committee,
1980 - 1983.

Assistant Professor, Department of Economics, Washington University in St. Louis; September 1972
- June 1978.

Assistant in Instruction, Woodrow Wilson School of Public and International Affairs, Princeton
University, Princeton, N.J.; 1969 - 1971.

Research Consultant, Ford Foundation, Kingston, Jamaica, W.I.; Summer 1969.

Fields Taught

Graduate: Industrial Organization, Economic Development and Planning, Microeconomic Theory,
International Trade, International Finance, Economic Theories of Behavior, Applied
Microeconomics.

Undergraduate: Government and Business, Industrial Organization, International Trade, International
Finance, Economic Development, Intermediate Microeconomic Theory, Intermediate
Macroeconomic Theory, Introductory Microeconomic Theory, Introductory Macroeconomic
Theory.

Grants

National Science Foundation. Grant title: "Income Maximizing in Choice and Rate Effects," 1988 -
1991.

National Science Foundation. Grant title: "Application of Economic Theory to Operant Schedule
Effects," 1985 - 1987.

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National Science Foundation. Grant title: "Income and Choice," 1983 - 1985.

Professional Activities

Referee, *American Economic Review*, *The Bell Journal of Economics*, *Rand Journal*, *Economic Inquiry*, *Industrial Organization Review*, *Journal of Industrial Economics*, *Journal of Law and Economics*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Southern Economic Journal*.

Member, Editorial Board, *International Journal of the Economics of Business*.

Member, American Bar Association, American Economic Association, Southern Economic Association, Western Economic Association.

Languages

French, German

Publications

"Market Definition and the Price Effects of Mergers: Staples- Office Depot (1997)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds.; Oxford University Press, third edition, forthcoming October 1998, with Serdar Dalkir.

"Unilateral Price Effects: Staples and Office Depot," in *The M&A Lawyer*, June 1998, Vol. 2, No. 3, with Serdar Dalkir. Available in revised form as "How Do You Know an Office Superstore? Staples and Office Depot," on <http://www.antitrust.org/cases/>.

"Resale Price Maintenance Reexamined: Monsanto v. Spray-Rite (1984)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds.; Oxford University Press, third edition, forthcoming October 1998.

"Exclusionary Behavior in the Market for Operating System Software: the Case of Microsoft," in *Opening Networks to Competition: the Regulation and Pricing of Access*, David Gabel and David F. Weiman, eds.; Kluwer Academic Publishers, 1998, with Kenneth C. Baseman and Glenn A. Woroch.

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"Riding the Wave: Exclusionary Practices in Markets for Microprocessors Used in IBM-Compatible Personal Computers," Conference and Festschrift in Honor of Merton J. Peck, Yale University, September 30, 1994, and *International Journal of the Economics of Business* 2-2 (July 1995), pp. 241-262, with Robert W. Wilson.

"The Economics of Intellectual Property Protection for Software: ~~The Proper Role for Copyright~~," American Council on Interoperable Systems, Washington, D.C., June 1994, and *StandardView: ACM Perspectives on Standardization* 3-2 (June 1995), pp.68-78, with Kenneth C. Baseman and Glenn A. Woroch.

"Microsoft Plays Hardball: Use of Nonlinear Pricing and Technical Incompatibility to Exclude Rivals in the Market for Operating Software," *The Antitrust Bulletin* 40-2 (Summer 1995), pp.265-315, with Kenneth C. Baseman and Glenn F. Woroch.

"Copyright Protection of Software Can Make Economic Sense," *The Computer Lawyer*, 12 (February 1995), pp. 10, 18-28, with Kenneth C. Baseman and Glenn A. Woroch.

"Exclusionary Practices in High-Technology Industries," *The St. Louis Bar Journal*, 16 (Summer 1994), pp. 28-34.

"Monsanto v. Spray-Rite: Resale Price Maintenance Reexamined," in *The Antitrust Revolution: The Role of Economics*, John E. Kwoka and Lawrence J. White, eds.; Scott, Foresman and Company, Glenview, Illinois, second edition, 1994.

"A Commentary on the 1992 U.S. Merger Guidelines," *International Merger Law*, 22 (June 1992), pp. 14-19.

"The Use of Stock Market Returns in Antitrust Analysis of Mergers," *Review of Industrial Organization*, 7-1 (1992), pp. 1-11, and *Economic Analysis Group Discussion Paper #88-1*, January 1988, with Robert H. McGuckin and Peter Waldstein.

"Implications of U.S. Experience with Horizontal Mergers and Takeovers for Canadian Competition Policy," in *The Law and Economics of Competition Policy*, Frank Mathewson, Michael Trebilcock and Michael Walker, eds.; The Fraser Institute, Vancouver, B.C., 1990.

"Maricopa and Maximum-Price Agreements: Time for a New Legal Standard?" *Journal of Health Economics*, 7 (June 1988), pp. 185-190.

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- "Maximizing Present Value: A Model to Explain Why Moderate Response Rates Obtain on Variable-Interval Schedules," *Journal of the Experimental Analysis of Behavior*, 49 (May 1988), pp. 331-338, with Alan Silberberg and Toshio Asano.
- "Sources of the 'Crisis' in Liability Insurance: An Economic Analysis," in *Yale Journal of Regulation*, 5 (Summer 1988), pp. 367-395; *Economic Analysis Group Discussion Paper #88-2*, February 1988; and *An Update on the Liability Crisis: Tort Policy Working Group*, U.S. Government Printing Office: 181-487:60075, March 1987, with Richard N. Clark and David D. Smith.
- "State and Federal Regulation in the Market for Corporate Control," *The Antitrust Bulletin*, 32 (Fall 1987), pp. 661-691, and *Economic Analysis Group Discussion Paper #86-4**, January 1986, with Margaret E. Guerin-Calvert and Robert H. McGuckin.
- "Income and Choice Between Different Goods," *Journal of the Experimental Analysis of Behavior*, 48 (September 1987), pp. 263-275, with Alan Silberberg and David Shurtleff.
- "Inferior-Good and Giffen-Good Effects in Monkey Choice Behavior," *Journal of Experimental Psychology: Animal Behavior Processes*, 13 (1987), pp. 292-301, with Alan Silberberg and Toshio Asano.
- "Efficiencies, Failing Firms, and Alternatives to Merger: A Policy Synthesis," *The Antitrust Bulletin*, 31 (Summer 1986), pp. 431-450, and *Economic Analysis Group Discussion Paper #86-14*, August 1986, with John Kwoka.
- Oil Pipeline Deregulation: Report of the U.S. Department of Justice*, U.S. Government Printing Office: 1986, 491-510:40159, May 1986, with Charles J. Urdiet.
- "Merger Policy and Enforcement at the Antitrust Division: The Economist's View," *Antitrust Law Journal*, 54 (Spring 1985), pp. 109-115.
- "Reanalysis of the Equation for Simple Action," *Journal of the Experimental Analysis of Behavior*, 43 (March 1985), pp. 265-277, with Alan Silberberg, Michael Gray and Randolph Ollom.
- "Considering the Effects of Financial Incentive and Professional Ethics on 'Appropriate' Medical Care," *Journal of Health Economics*, 3 (December 1984), pp. 223-237, with Robert Woodward.

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Deficits and Dollars: The Effects of Government Deficits in an International Economy. Center for the Study of American Business, Contemporary Series 3, 1982.

"Physician Productivity, Remuneration Method, and Supplier-Induced Demand," in *Issues in Physician Reimbursement*, N.T. Greenspan (ed.), HCFA, 1981, pp. 115-134, with Robert Woodward.

"Paying the Doctor: A Model of Work-Leisure Decisions under Alternative Remunerations," *Proceedings of the American Statistical Association*, 1979, with Robert Woodward.

Vertical Control of Markets: Business and Labor Practices. Ballinger Publishing Company, Cambridge, Mass., 1978.

"Vertical Control by Labor Unions," *American Economic Review*, 67 (June 1977), pp. 309-322. Reprinted as Publication Number 17, Center for the Study of American Business, November 1977.

"Vertical Control with Variable Proportions," *Journal of Political Economy*, 82 (July - August 1974), pp. 783-802.

Preliminary Survey of Jamaican Management Manpower: Resources and Requirements. Jamaican Institute of Management, 1969.

Conference, Seminar, Working and Discussion Papers

"Proving Damages in a Business Case," Business Litigation Seminar, Business Law Section of the Florida Bar, November 20 (Tampa) -21 (Miami), 1997.

"Basic Economics for Lawyers," Section of Antitrust Law, American Bar Association, New York, N.Y., October 3-4, 1996.

"Vertical Control in the Entertainment Industry," Chair's Showcase Program: The Integration, Disintegration and Reintegration of the Entertainment Industry, American Bar Association, Section of Antitrust Law, 44th Annual Antitrust Spring Meeting, Washington D.C., March 28, 1996.

"Privatization and Regulation in the Restructuring of Electric Utilities in Eastern Europe," IBRD Conference on the Privatization of Electric Utilities, Prague, The Czech Republic, September 1993.

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- "Implications of the United States Experience with Regulation and Antitrust for Competition Policy in Countries in Transition from Centrally Planned Economies to Market Economies," IBRD/EDI/USAID Seminar on Microeconomics, Vienna, Austria, July 1993.
- "The Economics of Punitive Damages." Punitive Damages after TXO: American Bar Association Antitrust Section Meeting, New York, August, 1993.
- "Regulatory Alternatives for FERC Following the Energy Policy Act of 1992," The Federal Energy Bar Association Mid-Year Meeting, Washington, D.C., November 19, 1992.
- "The Economics of Credit Card Interest Rate Caps," Seminars at the Economic Analysis Group, U.S. Department of Justice, September 29, 1992; the Board of Governors of the Federal Reserve System, October 7, 1992; and the D.C. Bar Association, November 19, 1992.
- "Straws in the Bottleneck: A Proposal for Efficient Network Interconnection," presented at the Tenth Biennial Conference of the International Telecommunications Society, Cannes, France, June 1992; *Journal of Regulatory Economics* Editors' Conference, San Diego, October 1992, with John Woodbury and Glenn Woroch.
- "Economic Principles of Penalties for Antitrust Violations, and the Role of the Economist in Corporate Sentencing," Corporate Sentencing Under the Federal Sentencing Guidelines for An Antitrust Defendant, The Federal Bar Association, Antitrust and Trade Regulation Section, May 1992.
- "The State of Antitrust in 1991: A Kindler, Gentler Antitrust?," The CATO Institute Conference, 1991, with Steve Calkins.
- "Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule," Telecommunications Policy Research Conference, October 1990, with John Woodbury.
- "The Design and Evaluation of Competitive Rules Joint Ventures for Mergers and Natural Monopolies," American Enterprise Institute conference on Policy Approaches to the Deregulation of Network Industries, October 1990, and at the American Economic Association Meetings, December 1989, with John Woodbury.
- "Regulation and the Partially Monopolized Network: Lessons from Telecommunications," American Enterprise Institute conference on Policy Approaches to the Deregulation of Network Industries, October 1990, with Roger Noll.

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"Price Regulation and Common Carrier Regulation," AEI Conference on Oil Pipeline Deregulation, American Enterprise Institute.

"Regulation of New Crude-Oil Pipelines: Natural Monopoly and Information Externalities," AEI Conference on Oil Pipeline Deregulation, American Enterprise Institute.

"Economic Theory as the Missing Link in the Merger Guidelines," American Bar Association Antitrust Section Spring Meeting, March 1990.

"Testing the Structure-Competition Relationship on Cross-Sectional Firm Data," *Economic Analysis Group Discussion Paper #88-6*, May 1988, and at the Southern Economic Association Meetings, November 1986, with Donald M. Brown.

"Deterring Criminal Antitrust Behavior: Sanctions versus Structure," Stanford University Conference, June 1987.

"Deregulation of Electric Power Generation," New Mexico State University Conference, September 1986, and Edison Electric Institute, April 1987.

"Do Successful Tender Offers Benefit Bondholders?" Southern Economic Association Meetings, November 1986, with Catherine Benham, Donald M. Brown and Susan E. Woodward.

"Professional Ethics and Financial Incentives: 'Appropriate' Medical Care," *Washington University Department of Economics Working Paper #40*, May 1982, with Robert Woodward.

"Hospital Care Expenditure Inflation: Crisis or Consumption?" *Washington University Department of Economics Working Paper #43*, December 1982, with Robert Woodward and Walter Chien.

"Transfer Pricing within U.S. Corporations," Sixth U.S.-Soviet Economic Symposium; Alma-Ata, Kazakhstan, U.S.S.R., May - June, 1981.

"The Impact of Automobile Mileage Standards," Western Economic Association Meetings, 1979, with Michael Smirlock.

"The Effect of Factor-Augmenting Technical Change on Factory Demand, and the Response by Factor Suppliers," Western Economic Association Meetings, October 1977.

"Vertical Integration in Telecommunications," Telecommunications Policy Research Conference, April 1974.

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Other Papers

Brief Amicus Curiae of Economics Professors and Scholars in Support of Respondent, Supreme Court of the United States, *Lotus Development Corp. v. Borland International, Inc.*, No. 94-2003, December 1995.

"Implementing Competitive Rules Joint Ventures for Railroads," IBRD (World Bank) , April, 1995.

"Critical Loss and Critical Elasticity: Their Derivation and Use in Market Definition for Mergers," November 1994.

"When Nominally Monopolistically-Competitive Firms are Really Perfectly Competitive: Going First-Class on the Paris Metro," July 1986.

"Mandatory Energy Performance Standards and Residential Energy Demand," 1981, with Alan Rockwood and Richard Adams.

"The Effects of Endogenous Quality Change on Demand and Costs," October 1977.

Testimony, Depositions, Commissioned Studies, and Government Consulting

Brunswick Corporation: Expert witness in Concord Boat Co. et. al. v. Brunswick Corporation. U.S. District Court, Eastern District of Arkansas, Western Division. Trial testimony June 11, 1998. Depositions February 2-4, 1998.

Bepco, Inc.: Deposition in Bepco, Inc. et. al. v. Allied Signal, Inc. and Allied Signal Truck Brake System Company, November 25-26, 1998.

St. Louis Convention and Visitors Commission: Declaration in St. Louis Convention and Visitors Commission v. National Football League, et al.; U.S. District Court, Eastern District of Missouri, Eastern Division, C.A. No. 4:95CV02443 JCH, September 12, 1997.

AT&T: (a) Direct Testimony and Deposition in State of Indiana, Indiana Utility Regulatory Commission, Cause No. 397051994, April 1994; (b) Position Paper on Docket No. 94-07-02: Development of the Assumptions, Tests, Analysis and Review to Govern Telecommunications Service Reclassifications in Light of the 8 Criteria Set Forth in Section 8 of Public Act 94-83. State Of Connecticut, Department of Public Utility Control, October

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1994; (c) Comments on the Position Papers on Docket No. 94-07-02. State Of Connecticut, Department of Public Utility Control, November 1994; (d) Rebuttal Testimony in Kansas Corporation Commission Docket No. 190, 492-U, July 15, 1996; (e) Direct and Rebuttal Testimony in AT&T Communications of the Southwest Inc., Missouri Case No. TO-97-40; (f) In the Matter of Southwestern Bell Telephone Company - Kansas Compliance with Section 271 of the Federal Telecommunications of 1996, Docket No. 97-SWBT-411-GIT; (g) Application of Ernest G. Johnson, Director of the Public Utility Division Oklahoma Corporation Commission to Explore The Requirements of Section 271 Of The Telecommunications Act of 1996, Cause No. PUD 970000064; (h) Declaration in In the Matter of Implementation of the Pay Telephone Reclassification and Compensation Provisions of the Telecommunications Act of 1996, Federal Communications Commission, CC Docket No. 96-128, September 9, 1997.

Federal Trade Commission: Expert witness in FTC v. Staples and Office Depot; U.S. District Court, District of Columbia, Trial Testimony, May 1997.

Leo One USA: Affidavit in Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile Satellite Service, FCC Docket No. 96-220, December 20, 1996.

Florida Panthers Hockey Club: Expert witness in Florida Panthers Hockey Club v. Miami Sports and Exhibition Authority and The City of Miami; U.S. District Court, Southern District of Florida Miami Division, Case No. 96-21 68-CIV. Trial Testimony, August, 1996.

ADM: "An Evaluation of: The Cost to U.S. Animal-Feed Manufactures of an Alleged Price-Fixing Conspiracy by Lysine Manufactures 1992-1995," August, 1996.

MCI: (a) "Depreciation and Capital Recovery Issues, A Response to Professor Hausman", with K. Baseman and S. Woodward, FCC Docket No. 96-98, July 1996; (b) In the Matter of Southwestern Bell Telephone Company - Kansas Compliance with Section 271 of the Federal Telecommunications of 1996, Docket No. 97-SWBT-411-GIT. (c) "Declaration of Kenneth C. Baseman and Frederick R. Warren-Boulton on Behalf of MCI Telecommunications Corporation," Before the Federal Communications Commission In the Matter of Application of BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in South Carolina. Docket No. 97-208, October 17, 1997.

K-2, Rossignol, Salomon, Tecnica, Skis Dynastar, Marker and The Ski Market: Expert witness in Sports Investment Co. vs. The Ski Market, Ltd., Inc., et al, U.S. District Court, District of Rhode Island, C.A. No. 95-097T. Deposition, December 1995.

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U.S. Department of Justice, Antitrust Division: (a) Expert witness in U.S. v. AT&T, 1981; (b) Regulation of oil pipelines, August 1983; (c) Expert witness in United States of America v. Engelhard Corporation, Floridin Company, U.S. Borax Inc., U.S. Silica Inc. Case No. 6:96-CV-45 (WLS), Depositions, Trial Testimony August 1995.

City of Los Angeles: Declaration in Air Transport Association of America, et al., v. City of Los Angeles, City of Los Angeles Department of Airports and Los Angeles Board of Airport Commissioners, Docket No. 50176, March 1995.

The Bon-Ton Stores, Inc.: Declaration in The Bon-Ton Stores, Inc. v. The May Department Stores Company, McCurdy & Company, Inc., and Wilmore, Inc., Civil Action No. 94-CV-6454L, November 1994.

Cyrix Corporation: Deposition in Cyrix Corporation v. Intel Corporation, December 1993.

Thermadyne Industries: Deposition in Thermadyne Industries, Inc. and Coyne Cylinder Co. v. K.C. Cylinder et al., December 1993.

IBRD (World Bank): (a) Privatization and Regulation in the Restructuring of Electric Utilities in Eastern Europe, September 1993; (b) Implications of the United States Experience with Regulation and Antitrust for Competition Policy in Countries in Transition from Centrally Planned Economies to Market Economies, July 1993.

Credit Card Coalition: "The Economics of Credit Card Interest Rate Caps," 1993, with Laurence H. Meyer.

Coalition to Preserve the Financial Interest and Syndication Rule: (a) Testimony before the Federal Communications Commission, December 7, 1990, in the matter of Evaluation of the Syndication and Financial Interest Rules, MM Docket No. 90-162; (b) Submitted reports: "Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule," June 14, 1990; "Reply Comments," August 1, 1990; "Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule," January 24, 1991, with John Woodbury; (c) Declaration of Frederick R. Warren-Boulton, August 7, 1992, Exhibit 7, Comments of the Coalition to Preserve the Financial Interest and Syndication Rule on Proposed Modification of Network Consent Decrees. In United States of America v. CBS, Inc. Civil No. 74-3599-RJK, United States of America v. American Broadcasting Companies, Inc. Civil No. 74-3600-RJK, and United States of America v. National Broadcasting Company, Inc. Civil No. 74-3601-RJK.

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California Public Utility Commission, Division of Ratepayer Advocacy: Proposed merger of Southern California Edison Company and San Diego Gas and Electric Company, July 1990.

Altai, Inc.: Expert witness in Computer Associates, Inc. v. Altai, Inc., April 1990.

NFL Players Association: Deposition in Marvin Powell v. National Football League, September 1989.

Consolidated Aluminum Corporation: Deposition in Indal, Inc. v. Consolidated Aluminum Corp., April 1983.

Battelle, Pacific Northwest Laboratories. Analyses of bidding for offshore oil leases and of the effects of Building Energy Performance Standards on energy demand, September 1979 - 1981.

U.S. Senate Commerce Committee, Senator Danforth presiding: Testimony on corporate average fuel economy (CAFE) standards, November 15, 1979.

State of Missouri, Office of the Public Counsel: Expert witness on electric utility rate structures, 1978.

Federal Trade Commission: Study on Vertical Distribution Arrangements, January 1, 1977 - August 1, 1978.

EXHIBIT 1

Exhibit 1

Microsoft's Actual and Projected Share of the (Intel-Based) PC Operating System Market (According to IDC)

	Year ^{4,5,6}										
Operating System ¹	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Microsoft ²	93	92	93	93	90	94	95	95	95	95	96
IBM OS/2	0	3	3	4	7	3	3	3	3	3	3
UNIX ³	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Intel	7	4	4	3	3	2	2	2	2	2	2

Notes:

¹ Operating systems used in single-user client and PC operating environment.

² Includes Microsoft 16-bit and 32-bit Windows and MS-DOS.

³ Intel-based UNIX operating systems.

⁴ Market shares may not total 100% due to rounding.

⁵ The market shares for the years 1997-2001 are forecasts.

⁶ Worldwide

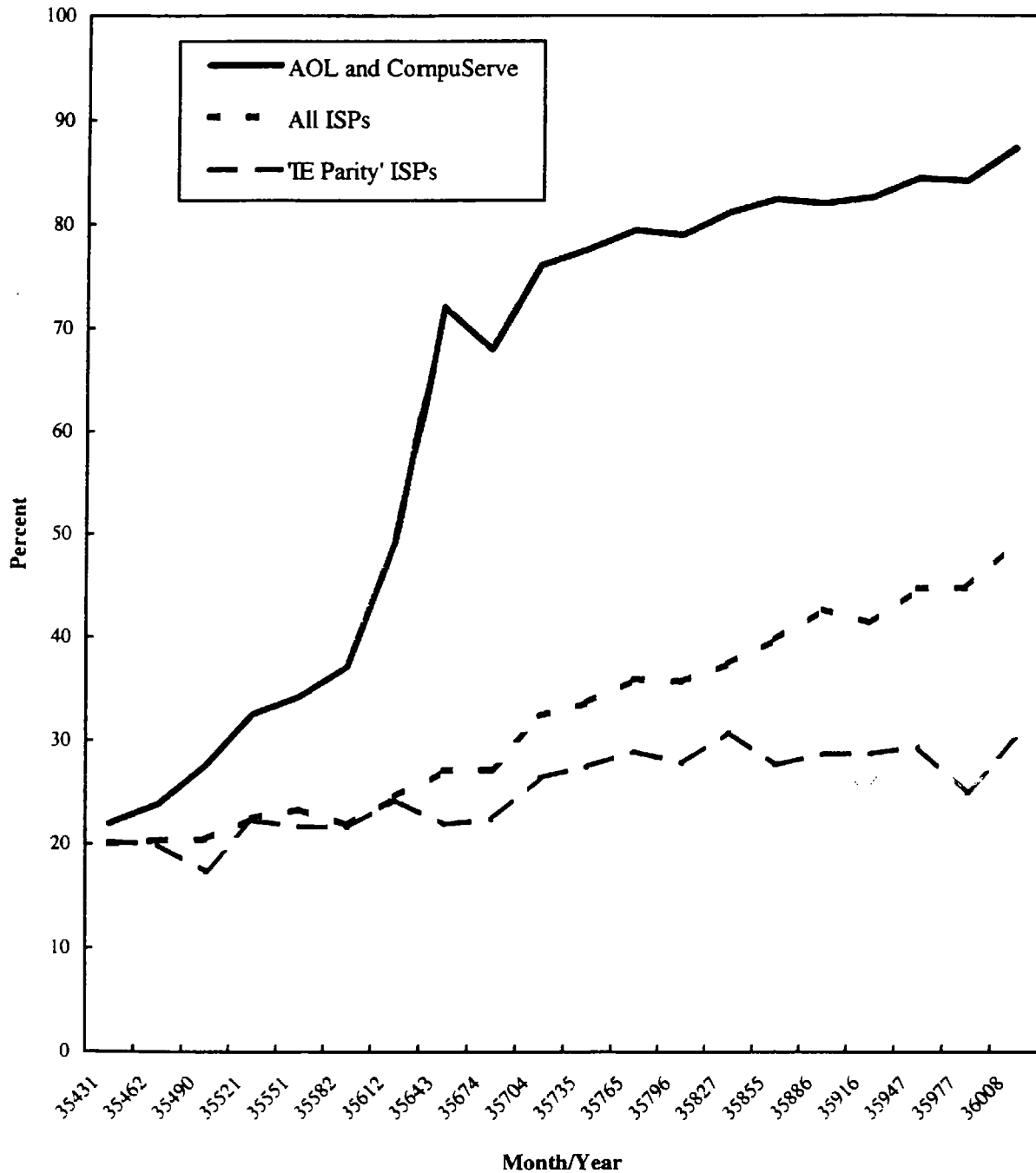
Sources:

International Data Corporation (1997), OPERATING ENVIRONMENTS, REVIEW AND FORECAST 1996-2001.

International Data Corporation (1997), CLIENT OPERATING ENVIRONMENTS, REVIEW AND FORECAST 1996-2001.

EXHIBIT 4

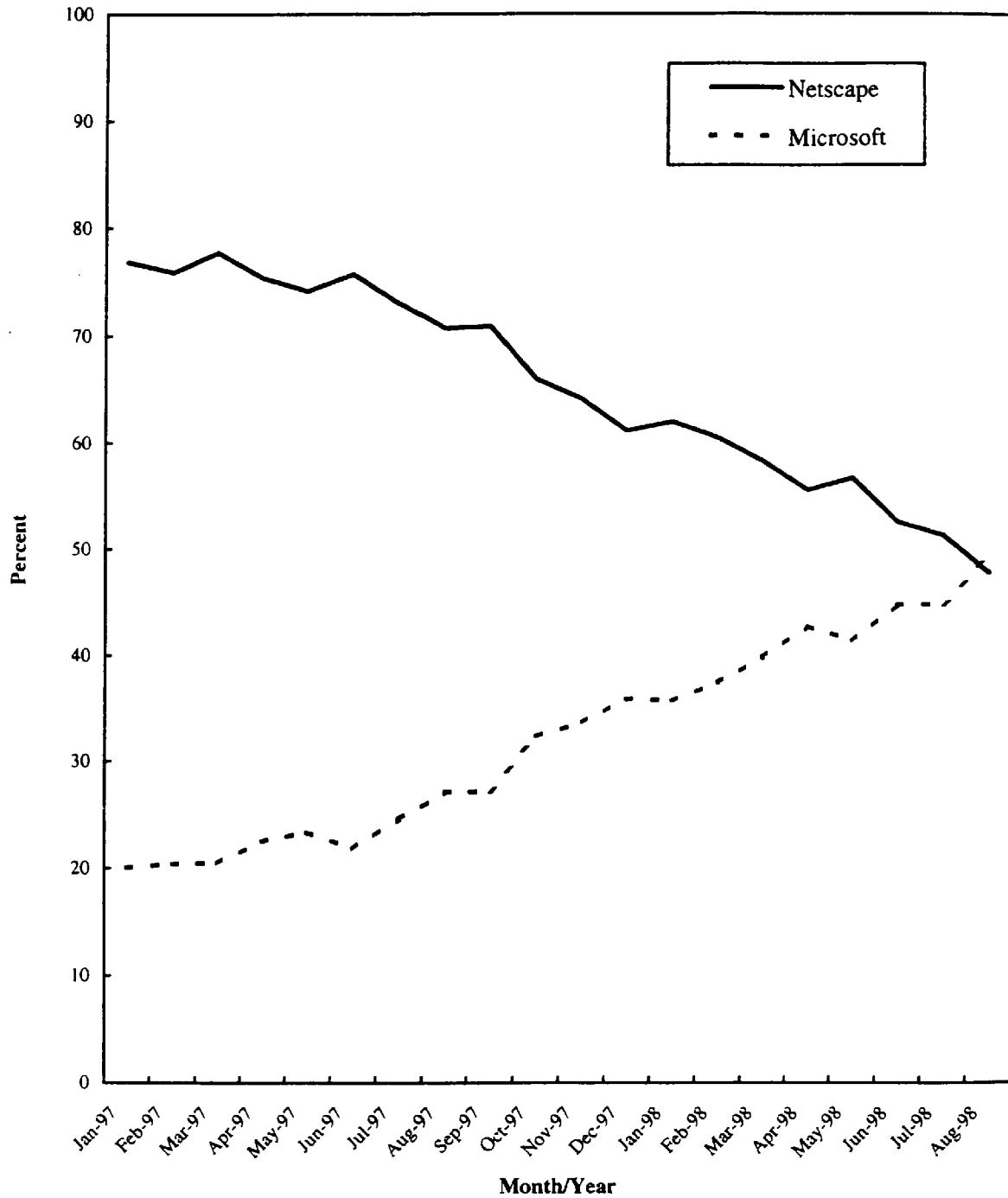
Microsoft's Share of the Browser Market
Monthly Usage by ISP Category
 (According to AdKnowledge, Inc.)



Sources: AdKnowledge, Inc.
 MS98 0112834-36

EXHIBIT 5

**Microsoft's Share of the Browser Market
Compared to Netscape's Share
Monthly Browser Usage
(According to AdKnowledge, Inc.)**



Source: AdKnowledge, Inc.

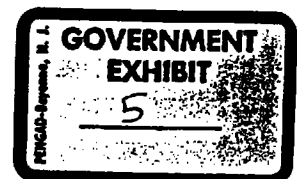
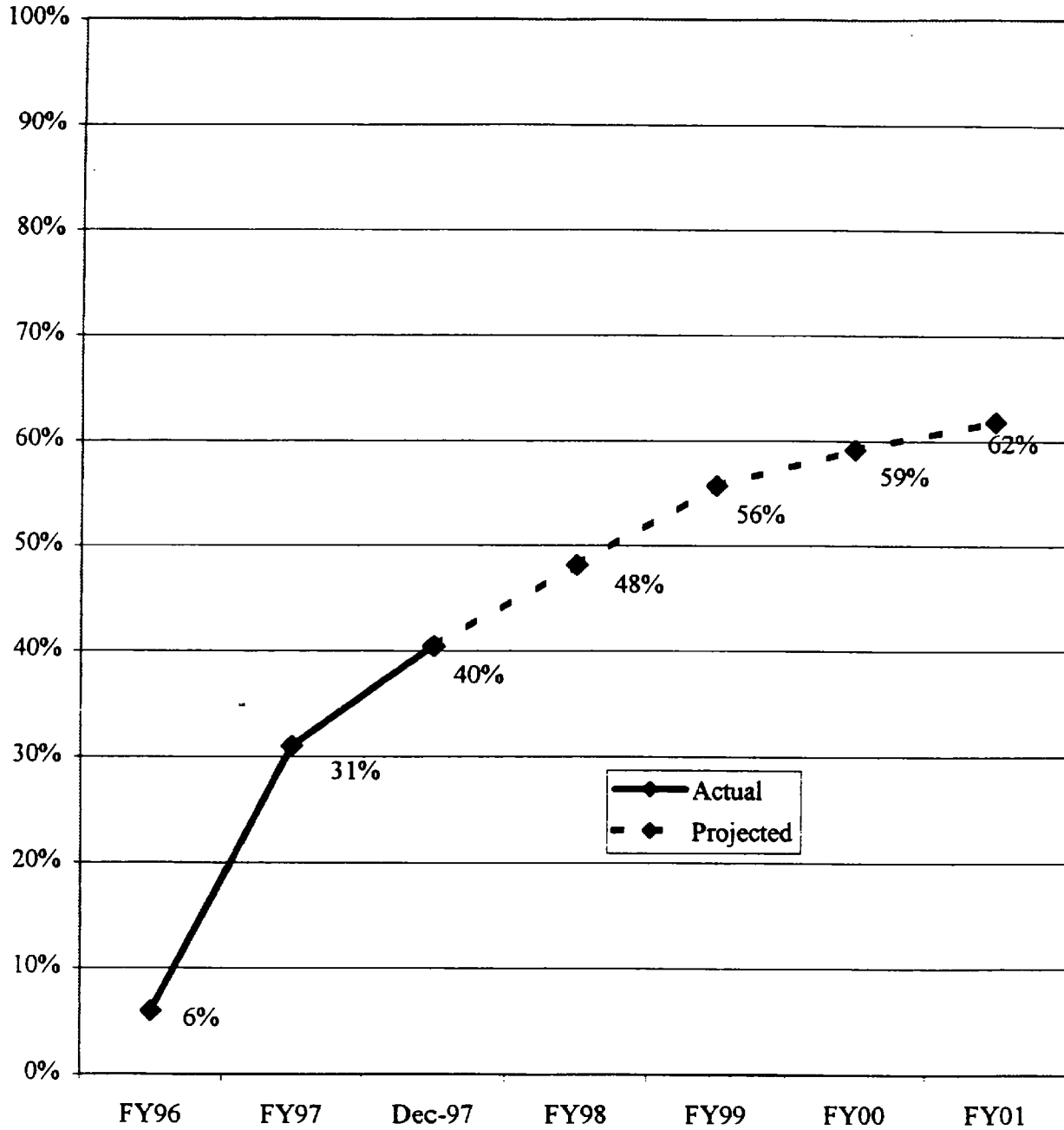


EXHIBIT 14

Exhibit 14

Actual and Projected Shares of Browser Market Held by Microsoft



Source: MS98 0203023-25

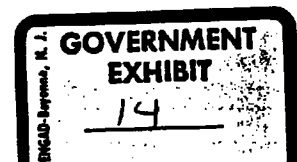
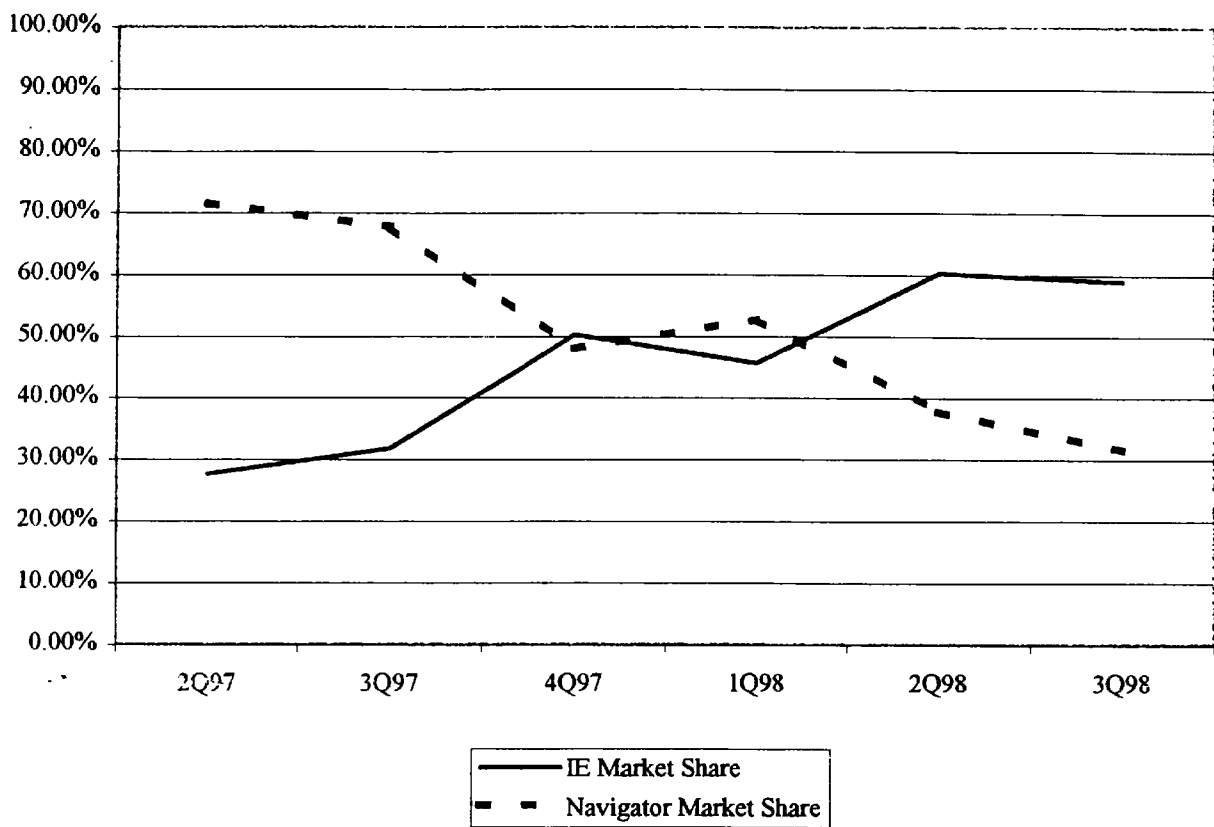


EXHIBIT 261

Revised Exhibit 261

"Flow" Market Share



Source: See Exhibit 337

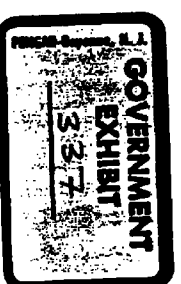


EXHIBIT 337

Revised Exhibit 337: Calculation of "Flow" Market Share

Step 1: Usage Share of Active Installed Base By Quarter

Browser Type/Release	Date									
	Jan-97	Feb-97	Mar-97	Total IQ97	Usage Share	Apr-97	May-97	Jun-97	Total 2Q97	Usage Share
CyberDog	1275	1224	1718	4217	0.06%	1434	2342	1703	5479	0.05%
MSIE 1.x	528	411	421	1360	0.02%	621	260	374	1255	0.01%
MSIE 2.x	30056	38622	48480	117158	1.76%	54486	45403	44649	144538	1.23%
MSIE 3.x	248737	419649	551014	1219400	18.34%	690300	695094	885230	2270624	19.37%
MSIE 4.x	4191	4391	6260	14842	0.22%	82879	59703	75655	218237	1.86%
MSIE 5.x	0	3	0	3	0.00%	0	7	2	9	0.00%
MSIE 6.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Neiscape 0.x	1022	1044	1324	3390	0.05%	1273	834	763	2870	0.02%
Neiscape 1.x	52065	66616	76245	194926	2.93%	70527	60578	67911	199016	1.70%
Neiscape 2.x	325453	512435	536774	1374662	20.67%	630983	554063	625548	1810594	15.45%
Neiscape 3.x	673685	1086730	1535084	3295499	49.56%	1868150	1724516	2378390	5971056	50.94%
Neiscape 4.x	34350	56938	155152	246440	3.71%	204498	203712	421132	829342	7.08%
Neiscape 5.x	0	0	0	0	0.00%	3	0	0	3	0.00%
Neiscape 6.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Neiscape 7.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Neiscape 8.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Neiscape 9.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Opera	219	468	653	1340	0.02%	603	732	641	1976	0.02%
Other	37642	74537	40854	153033	2.30%	63438	67910	84083	215431	1.84%
WebTV	4704	8399	9948	23051	0.35%	12178	14150	25153	51481	0.44%
Total				6649321					11721911	



Step 1: Usage Share of Active Installed Base By Quarter

Browser Type/Release	Date									
	Jul-97	Aug-97	Sep-97	Total 3Q97	Usage Share	Oct-97	Nov-97	Dec-97	Total 4Q97	Usage Share
CyberDog	1849	1063	1216	4128	0.03%	1696	1679	1739	5114	0.03%
MSIE 1.x	371	381	158	910	0.01%	79	163	76	318	0.00%
MSIE 2.x	47299	31070	39418	117787	0.84%	35550	47690	44990	128230	0.73%
MSIE 3.x	1102939	920935	1051708	3075582	21.97%	982734	1257519	1368624	3608877	20.53%
MSIE 4.x	84552	182305	208559	475416	3.40%	484110	819084	960642	2263836	12.88%
MSIE 5.x	1	3	1	5	0.00%	0	61	234	295	0.00%
MSIE 6.x	0	1	0	1	0.00%	0	0	0	0	0.00%
Netcape 0.x	567	294	521	1382	0.01%	309	359	340	1008	0.01%
Netcape 1.x	71643	30391	37273	139307	1.00%	30967	32689	31410	95066	0.54%
Netcape 2.x	568958	339920	377381	1286259	9.19%	261638	347166	329681	938485	5.34%
Netcape 3.x	2294198	1780274	1975539	6050011	43.22%	1634058	2174080	2077320	5885458	33.48%
Netcape 4.x	734420	810665	1003304	2548389	18.20%	1137205	1493750	1606228	4237183	24.10%
Netcape 5.x	8	6	0	14	0.00%	0	1	1	2	0.00%
Netcape 6.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Netcape 7.x	0	0	0	0	0.00%	0	2	0	2	0.00%
Netcape 8.x	0	0	0	0	0.00%	0	0	0	0	0.00%
Netcape 9.x	0	3	0	3	0.00%	0	0	0	0	0.00%
Opera	597	1279	930	2806	0.02%	1680	2141	2968	6789	0.04%
Other	96530	66998	69544	233072	1.66%	53050	106381	150615	310046	1.76%
WebTV	20676	21078	21577	63331	0.45%	22438	33570	42061	98069	0.56%
Total				13998403					17578778	

Step 1: Usage Share of Active Installed Base By Quarter

Date

Browser Type/Release	Date											
	Jan-98	Feb-98	Mar-98	Total 1Q98	Usage Share	Apr-98	May-98	Jun-98	Total 2Q98	Usage Share		
CyberDog	1076	1365	1187	3628	0.02%	1045	1418	990	3453	0.01%		
MSIE 1.x	36	73	72	181	0.00%	102	49	47	198	0.00%		
MSIE 2.x	27527	35441	45222	108190	0.54%	40217	40854	39505	120576	0.47%		
MSIE 3.x	864621	1200121	1616359	3681101	18.45%	1687453	1562813	1705424	4955690	19.24%		
MSIE 4.x	895335	1264934	1624831	3785100	18.97%	1845808	2107319	2003741	5956868	23.13%		
MSIE 5.x	291	335	418	1044	0.01%	193	894	1166	2253	0.01%		
MSIE 6.x	2	0	0	2	0.00%	14	28	16	58	0.00%		
Neiscape 0.x	213	292	205	710	0.00%	221	151	187	559	0.00%		
Neiscape 1.x	18371	21148	23188	62707	0.31%	25301	16609	15826	57736	0.22%		
Neiscape 2.x	189331	240734	287390	717455	3.60%	259546	253097	206335	718978	2.79%		
Neiscape 3.x	1422842	1838045	2139261	5400148	27.06%	1961770	2022455	1741741	5725966	22.24%		
Neiscape 4.x	1473725	1939467	2363580	5776772	28.95%	2400622	2796821	2441361	7638804	29.66%		
Neiscape 5.x	1	1	7	9	0.00%	187	136	66	389	0.00%		
Neiscape 6.x	5	0	0	5	0.00%	1	14	1	16	0.00%		
Neiscape 7.x	0	0	0	0	0.00%	0	0	0	0	0.00%		
Neiscape 8.x	0	0	0	0	0.00%	2	1	0	3	0.00%		
Neiscape 9.x	0	0	0	0	0.00%	0	2	0	2	0.00%		
Opera	3877	8354	11002	23233	0.12%	10144	12076	10160	32380	0.13%		
Other	75558	89929	86780	252267	1.26%	86561	108844	130687	326092	1.27%		
WebTV	38337	41948	61744	142029	0.71%	56021	62662	92502	211185	0.82%		
Total				19954581					25751206			

Step 1: Usage Share of Active Installed Base By Quarter

Browser Type/Release	Date			
	Jul-98	Aug-98	Total 3Q98	Usage Share
CyberDog	1136	235	1371	0.01%
MSIE 1.x	38	26	64	0.00%
MSIE 2.x	35670	28847	64517	0.46%
MSIE 3.x	1355558	1269757	2625315	18.74%
MSIE 4.x	1903154	1931238	3834392	27.38%
MSIE 5.x	17944	16243	34187	0.24%
MSIE 6.x	3	2	5	0.00%
Netcape 0.x	128	81	209	0.00%
Netcape 1.x	9188	8256	17444	0.12%
Netcape 2.x	161685	119129	280814	2.01%
Netcape 3.x	1421166	1097015	2518181	17.98%
Netcape 4.x	2205669	1927895	4133564	29.51%
Netcape 5.x	55	44	99	0.00%
Netcape 6.x	23	1	24	0.00%
Netcape 7.x	0	0	0	0.00%
Netcape 8.x	6	6	12	0.00%
Netcape 9.x	0	0	0	0.00%
Opera	9582	6793	16375	0.12%
Other	195310	91509	286819	2.05%
WebTV	89118	102960	192078	1.37%
Total			14005470	

Step 2: Total Users By Quarter

Browser Type/Release	Quarter					
	1Q97	2Q97	3Q97	4Q97	1Q98	2Q98
CyberDog	20,916	17,472	12,321	13,436	9,475	7,783
MSIE 1.x	6,745	4,002	2,716	835	473	446
MSIE 2.x	581,088	460,930	351,570	336,891	282,552	271,782
MSIE 3.x	6,048,058	7,240,996	9,179,984	9,481,392	9,613,648	11,170,274
MSIE 4.x	73,614	695,955	1,419,020	5,947,645	9,885,255	13,425,959
MSIE 5.x	15	29	15	775	2,727	5,078
MSIE 6.x	0	0	3	0	5	131
Netcape 0.x	16,814	9,152	4,125	2,648	1,854	1,260
Netcape 1.x	966,806	634,660	415,803	249,761	163,767	131,139
Netcape 2.x	6,818,136	5,773,965	3,839,221	2,465,627	1,873,722	1,621,598
Netcape 3.x	16,345,225	19,041,634	18,058,048	15,462,521	14,103,151	12,905,499
Netcape 4.x	1,222,309	2,644,763	7,606,421	11,132,104	15,086,751	17,211,093
Netcape 5.x	0	10	42	5	24	877
Netcape 6.x	0	0	0	0	13	36
Netcape 7.x	0	0	0	5	0	0
Netcape 8.x	0	0	0	0	0	7
Netcape 9.x	0	0	9	0	0	5
Opera	6,646	6,301	8,375	17,836	60,676	72,985
Other	759,023	687,007	695,672	814,566	658,826	735,021
WebTV	114,330	164,172	189,030	257,651	370,926	476,017

Internet Users

32,979,725 37,381,050 41,782,375 46,183,700 52,113,845 58,043,990 63,974,135

Steps 3, 4, 5 and 6: New Browsers by Type and Flow Market Shares

	Quarter					
	2Q97	3Q97	4Q97	1Q98	2Q98	3Q98
Min. New IE Browsers	1,815,293	2,662,056	4,830,793	4,071,823	5,100,807	5,053,393
Min. New Nav Browsers	4,118,873	4,961,699	3,525,689	3,954,678	2,132,229	1,663,307
Min. New Other Browser	49,843	35,597	198,090	156,115	193,596	978,278
IE to Nav Switchers	268,381	336,076	438,132	630,702	791,386	994,987
Nav to IE Switchers	1,268,465	1,405,209	1,496,183	1,465,634	1,561,464	1,533,876
Total New Browsers	7,520,854	9,400,637	10,488,887	10,278,951	9,779,482	10,313,840
IE MS	27.71%	31.89%	50.23%	45.75%	60.25%	58.93%
Nav Market Share	71.63%	67.73%	47.88%	52.73%	37.77%	31.58%

- (1) The "active installed base" by browser type and release for each quarter is the weighted average of the shares of the active installed base as reported by AdKnowledge.
- (2) The approximate number of users of each browser type and version is obtained by multiplying each browser's share of the "active installed base" by the number of users of the Internet in that quarter (Schmalensee Report, Appendix B)
- (3) The minimum number of new users of each browser type and release is the sum over all browsers of the difference (if positive) between the number of users in two consecutive quarters.
- (4) Step 3 underestimates the number of new browsers because the latter quarter's estimate for the number of users of each browser type is reduced as users switch away from that browser type. Step 4 adjusts the total for this switching. The estimate of the number of users switching away from each browser type is based on Microsoft's estimates of the percentage of users switching from one browser type to another in its browser market model of February, 1998. Microsoft assumed that 18% of Navigator users will switch to Internet Explorer annually and 13% of Internet Explorer users will switch to Navigator annually. (MS98 02035326). Because these estimates of the switch rates only account for switching from one browser type to another and omit switching to browser types other than Microsoft and Netscape as well as people who simply quit using the Internet, these switching percentages are rounded up to the nearest whole percentage when calculating the quarterly switching percentage. This yields approximate quarterly switching percentages of 5% and 4% for Navigator and Internet Explorer, respectively. The number of switchers away from a given browser type is the percentage given previously, multiplied by the initial quarter's installed base for that browser type. (Because the proportion of browsers in the "other" category is relatively small, I ignore people switching from these browsers in calculating the market share.)
- (5) The total number of new browsers for each browser type is the sum of the new browsers (by release) calculated in the third step plus the number of switchers away from that browser type calculated in step 4 above.
- (6) The "flow" measure of market share (i.e., a firm's share of current sales) is the number of new browsers of a particular type divided by the total number of new browsers of all types.